THE EFFICIENCY BRIEFING

INDUSTRY BEST PRACTICE ON REDUCING TOTAL COST OF OWNERSHIP AND DRIVING FLEET PROFITABILITY

BY SHELL COMMERCIAL FUELS

Leong Wei Hung, General Manager, Trading and Supply Products East, Shell

No matter your industry, one thing is common: the ever-present challenge of balancing operational efficiency with financial costs. While this can often seem a daunting task, there are underlying ties between cost and performance that, alongside the right expert insights, can help to focus your business' direction for the future ahead.

At the heart of this is the concept of Total Cost of Operations (TCO), which Shell defines as the total amount spent on a vehicle or equipment, encompassing: acquisition costs; operation fees over the asset's entire lifespan; and the potential business ramifications of productivity losses or extra costs during downtime. As it suggests, TCO demonstrates the importance of looking beyond absolute price and instead viewing financial and operational drivers as interrelated, both short- and longer-term.

And with fuel potentially accounting for up to a quarter of business costs in some industries, it is no surprise that fuel choice – alongside proper housekeeping practices – is a growing area of focus for those looking to control the TCO equation and improve overall efficiency [1]. With this in mind, it's key for decision-makers to transition further toward fuel choices that are situated within the wider context of the TCO framework.

Whether you are just departing on this journey, or are keen to accelerate your current activities, the following selection of carefully curated articles, offers cross-sector insights that can help you navigate the obstacles that TCO and efficiency often present. From a deep dive into the role that injection systems can have on performance to an analysis of how to use biofuels effectively, we are confident that these articles will better equip you to improve your bottom line.

Fortunately, this journey need not be undertaken alone. Whether your primary focus is efficiency gains, maintaining profitability, or differentiating in a competitive market, a contributor to success in any of these areas is collaborating with the correct partners. And this is exactly where we, at Shell Commercial Fuels, are able to offer expert direction.

Having been at the forefront of fuels technology for over a century, we see our role as more than a fuels supplier. Rather, we aspire to be an energy partner to our customers, for today and tomorrow. A partner who is keen on being at your side as you work to achieve your business ambitions.

I hope you will enjoy reading the following articles as much as we enjoyed creating them and that they are able to provide you with the insights needed to maximise the value from your operations.

1. This survey commissioned by Shell Commercial Fuels and conducted by independent research firm Edelman Intelligence, polled 500 fuel decision makers in the construction sector in 10 countries (Germany, Hong Kong, Indonesia, Malaysia, Netherlands, Philippines, Singapore, South Africa, Thailand, Turkey).

FARMS UNDER PRESSURE: HOW CAN FUEL PROTECT PROFITS, COME RAIN OR SHINE?

Around the world, farmers are talking about how rising equipment costs are adding to the pressure they're already feeling, working in an industry so transformed by globalisation.

In Germany, a farmer will tell you how two harvesters now cost what five did, back in the 90s. In America, another discusses the challenge of still paying off tractors years after buying them. Equipment upgrades requiring expensive new parts are frustrating farm managers in China.

And yet, Shell's latest global research shows nearly half of all farmers don't prioritise maintaining and protecting the equipment they have currently. It is only when equipment breaks down that they realise the effect on their operation. As a result, eight out of 10 farmers are forced to spend hard-earned money repairing broken and unreliable machines.

Farming is a capital-intensive business. Aside from the cost of the land, particularly in developed nations, buying workhorse vehicles like tractors or harvesters can be hugely impactful. For static machinery on dairy or wheat farms, or custom-made equipment, the required investment can be even higher.

Keeping up with constantly changing regulations, new technology, extreme weather and rising energy costs make turning a profit even more difficult. Farmers are rarely cash-rich and some are diversifying into niche markets or sharing equipment with new Uber-like models.

In this environment, valuable assets have to perform well - for as long as possible. If a large four-wheel-drive tractor and cab costs over US $75,000 to buy, and is used for 20 days a year, it needs to last 25 years to earn its keep. On top of that, it needs to remain in peak condition to handle the long, gruelling days out in the fields.

In this environment, valuable assets have to perform well – for as long as possible

When it comes to equipment that is used more frequently, and static machinery that runs daily, maintenance is even more crucial. For machines that are customised to fit into specific building types or serve a specific purpose - replacing these assets can lead to enormous expense. In short, farmers need agricultural machinery that runs effectively and efficiently on any terrain, come rain or shine. Longevity is critical, as is availability.

The question then, is: How can farm owners and managers get the best possible performance out of their machines?

Part of the answer comes down to using high-quality fuel with performance-enhancing additives. For example, Shell FuelSave Diesel with DYNAFLEX Technology is specially designed to help clean up and protect your engine from performance-robbing carbon deposits. Cleaned up and maintained injectors are then able to enhance both engine efficiency and fuel economy, improving your bottom line.

Cleaned up and maintained injectors are then able to enhance both engine efficiency and fuel economy

Added to this, farmers need the right support and partnerships to help them bridge this knowledge gap and provide the necessary support to ensure their equipment works as hard as they do. On top of providing superior fuels, a reliable fuel supply is paramount in peak seasons. Farmers are also increasingly looking for valuable partners with long-standing expertise in the agriculture sector. And with a deep understanding of the trends and opportunities likely to impact farmers' businesses, from evolving energy options to digital tools and integrated business solutions.

A reliable fuel supply is paramount in peak seasons

INJECTION SYSTEMS, FUEL PERFORMANCE AND MACHINE FAILURE: THE HIDDEN CONNECTION

CONSTRUCTION COMPANIES CAN REDUCE THEIR OPERATING COSTS BY 10% OR MORE EACH MONTH BY MANAGING FUEL USAGE EFFECTIVELY[1]

Often, when we're looking for ways to cut operating costs and downtime, or increase our company's efficiency and profitability, we think of large-scale changes: the adoption of fleet-wide telematics, the move to next-generation equipment or other major investments. What's sometimes overlooked, is the big bottom-line impact managers can make by paying more attention to the smallest components in the heart of their vehicles: a good example being the fuel injection system.

The big bottom-line impact managers can make by paying more attention to the smallest components in the heart of their vehicles

A fuel injector is an electronically controlled valve. Supplied with fuel by the vehicle's fuel pump, the injector pressurises the fuel and sprays it as a fine mist, mixed with air, into the cylinder, which is then heated up by the piston stroke. The high temperature causes the fuel to ignite, powering the engine.

When injectors get clogged or corroded, the whole engine runs at suboptimum efficiency and could even malfunction. According to one study, the presence of corrosion deposits reduced the injection quantity by 26% [2]. This cuts the amount of energy that is transmitted to the wheels and increases fuel consumption.

According to one study, the presence of corrosion deposits reduced the injection quantity by 26%

Today's fuel injectors in modern engines are more efficient than ever. One recently developed injector claims to offer a 15% improvement in fuel efficiency over older models [3]. But the more efficient injectors are, the more it matters that they be kept in good condition in order to deliver the engine performance they have been designed for.

So how can construction-site and equipment managers make the most of their fuel injectors and engines in order to increase equipment utilisation and overall site efficiency?

THE CONSTRUCTION SITE IS A HARSH ENVIRONMENT FOR FUEL INJECTORS

For an engine, a construction site is a tough place to be. One study of road construction sites found 25% more dust and particulates in the air than were present before work began [4]. Equipment such as excavators, trucks and cranes are often in operation for long hours in unforgiving conditions. In contrast with vehicles in other sectors, there's no regular return to an indoor depot for a strip down and maintenance.

One study of road construction sites found 25% more dust and particulates in the air than were present before work began

This makes it more important than ever that the operating conditions for construction equipment – including ongoing maintenance, fuel type and lubrication – are suitably optimised to enable reliable performance of injectors and engines. Furthermore, though the age and standard of engine technologies vary globally, the industry has experienced a general level of advancement in the sophistication and intricacy of engine components.

While these systems undoubtedly have a higher performance potential, they are also more susceptible to dirt and contaminants. Consequently, they require a greater standard of protection, not only to ensure optimum efficiency, but also avoid the unplanned (and often high) costs associated with engine failure, injector replacement, and the emergency rental of equipment.

Taking care of your fuel injectors, therefore, is an investment in fleet and business performance, as clean injectors are less likely to clog or fail. This reduces machine failure and unplanned downtime– particularly important on construction sites, where lost time can hit at company level in the form of: disrupted schedules; risk of contractual penalties; and blemishes on corporate reputation.

Taking care of your fuel injectors, therefore, is an investment in fleet and business performance, as clean injectors are less likely to clog or fail

With productivity targets in mind, by enhancing spray efficiency, a high-functioning and well-maintained injector system increases the power output of the engine. This helps improve the utilisation and output per unit of equipment, in demanding operations where every hour counts. It also helps reduce fuel consumption, which can further cut operating costs, as well as fuel-related CO2 emissions, another increasing focus area for forward-looking companies.

WHY THE RIGHT FUEL CAN MAKE ALL THE DIFFERENCE

No matter the age of your vehicle, when it runs on regular diesel, carbon deposits build up over time. Whereas, fuels with cleaning additives are specially formulated to tackle carbon deposits as well as other contaminants such as particulate matter, corrosion particles, water, and – in the case of biodiesel – microorganisms. The use of fuels containing these cleaning additives can increase the volumetric efficiency of fuel injectors by up to 5% [5].

No matter the age of your, when it runs on regular diesel, carbon deposits build up over time

The use of fuels containing these cleaning additives can increase the volumetric efficiency of fuel injectors by up to 5%

A good example of the benefits a company can reap by using fuel with high performing additives, as part of an optimised maintenance regime, is the case of Malaysia's Malbumi Group. One of Malaysia's leaders in construction, the group switched its fleet of over 300 construction vehicles and 60 stationary generators to Shell FuelSave Diesel with Dynaflex Technology

The results quickly became clear. "We have never seen injector carbon deposits as light as these, and which you can just wipe off," said Liew Yun Len, the company's chief mechanic. Historically, the company used to spend tens of thousands of dollars a year – and a great deal of time and effort – cleaning, maintaining and replacing fuel injectors.

Since switching to additivated fuel from Shell, the deposits are so light, they can easily be wiped away, without any need for replacement. "We no longer believe all diesel is the same," says Malbumi's owner, Mr Edward Ang. "Shell FuelSave Diesel with Dynaflex Technology makes a difference for us."

"We no longer believe all diesel is the same"

Advanced additivated fuels are not just designed to prevent build-up of carbon deposits, but also actively clean up such deposits already present in the engine. Furthermore, they may contain components designed to increase the corrosion protection and dehazing properties of the fuel, mitigating against the corrosive or fuel-aging effect of water that can be introduced during fuel storage.

FUELLING YOUR BOTTOM LINE

Using advanced fuels with active deposit control additives is the foundation on which to build modern, efficient and competitive construction operations. Choosing the right fuel can help construction companies safeguard and make the most of their equipment - from mitigating against the harshness of the environment in which it operates, to increasing its efficiency, reliability and productivity.

Using advanced fuels with active deposit control additives is the foundation on which to build modern, efficient and competitive construction operations.

All these factors can significantly reduce total cost of ownership and help provide a long-standing edge to construction companies both today and in the future. Ultimately, better equipping them to tackle market challenges and remain at the forefront of the industry.

1. Edelman Intelligence, "Shell Commercial Fuels Thought Leadership, Construction Sector Global Report", August 2018.
2. M. I. Karamangila and R. A. Taflan. "Experimental investigation of effect of corrosion on injected fuel quantity and spray geometry in the diesel injection nozzles", Fuel, Volume 112, 2013, p. 600.
3. The International Institute of Marine Surveying (IIMS). (2019). New diesel injector set to change fuel systems and reduce emissions. [online] Available at: https://www.iims.org.uk/new-diesel-injector-set-change-fuel-systems-reduce-emissions/ [Accessed 20 Jun. 2019].
4. Font, A., Baker, T., Mudway, I., Purdie, E., Dunster, C. and Fuller, G. (2019). Degradation in urban air quality from construction activity and increased traffic arising from a road widening scheme. [online] Science Direct. Available at: https://www.sciencedirect.com/science/article/pii/S0048969714010900 [Accessed 20 Jun. 2019].
5. Cooke, E. (2019). ISIS Improving the efficiency of engine fuel delivery – one neutron at a time. [online] Isis.stfc.ac.uk. Available at: https://www.isis.stfc.ac.uk/Pages/improving-efficiency-of-fuel-delivery.aspx [Accessed 20 Jun. 2019].

FUEL INJECTOR MAINTENANCE

As well as using advanced fuels with active deposit control additives,there are other steps you can take to ensure fuel injectors operate reliably at optimum performance:

- Ensure that drivers, or those responsible for vehicle maintenance, know when and how injectors should be serviced, as set out by the vehicle manual
- If injectors malfunction or become clogged, seek qualified assistance for their cleaning or replacement
- Monitor the engine for signs that injectors may be suffering from deposit build-up – loss of power, black smoke etc. – and take instant action
- Seek technical advice from fuel experts on proper fuel usage and maintenance practices to help reduce total cost of operations

PUSHING THE LIMITS OF FUEL EFFICIENCY FOR TRUCKS

When concept-truck builder Bob Sliwa pulled off Interstate 10 to arrive in Jacksonville, Florida after completing a coast-to-coast drive of the USA, he didn't quite know it yet, but he was potentially transforming the industry conversation around fuel efficiency irreversibly [1]. In his six-day journey from San Diego, the founder of AirFlow Truck Company had demonstrated a 2.48 times improvement in freight tonne efficiency [2]. And he did it in a truck carrying significantly more weight than average [3].

A 2.48 times improvement in freight tonne efficiency

That truck was the vehicle at the centre of the Starship Project – a hyper-fuel-efficient Class 8 semi, co-engineered by AirFlow Truck Company and Shell – powered not by an alternative fuel, but by diesel [4]. Equally notably, the truck's fuel efficiency was maximised through modifications using currently available technologies.

The truck's fuel efficiency was maximised through modifications using currently available technologies

The role of diesel here is key: though a growing number of new heavy-duty vehicles run on alternative fuels, the average lifespan of a European truck is 12 years, meaning there will continue to be plenty of diesel vehicles on the roads over the coming years [5]. On top of this, one IHS Markit report suggests that advancements in the diesel engine will allow it to remain cost competitive until at least 2040 [6]. The evolution of existing fuel technologies is enabling improvements in: engine cleanliness, engine efficiency and fuel economy – all of which ladder up to the much sought-after total cost of ownership (TCO) and CO2 emissions reduction for commercial fleets [7].

With this in mind, if the industry wants to hit its increasingly tighter targets – on fuel efficiency, running costs and carbon footprint – it must look to examples such as the Starship Project as inspiration for how we can best optimise these diesel-powered vehicles. In fact, the Starship truck exists as proof that leveraging existing technologies for our fleets now, is one viable option to help make road transport more efficient and lower carbon for tomorrow.

HOW TODAY'S TECHNOLOGY CAN HELP MEET TOMORROW'S GOALS

For those companies whose business and performance depends on a heavy-duty fleet, success relies on identifying the factors that are reducing efficiency and then effectively targeting them, such as in the case of the Starship Project.

These could include vehicle drag – both wind resistance and rolling resistance – which slows a vehicle down and reduces efficiency. To combat this, the Starship truck used a 100% carbon fibre cab with a streamlined and aerodynamic shape to help cut wind resistance. A gap closure system, boat tails off the back of the trailer, and full-length side skirts were also implemented to reduce wind resistance. Meanwhile, an automated system sensed when tyre pressure was low, then self-inflated as required, thereby reducing rolling resistance. Together, these two innovations helped keep the forces of drag at bay, while also increasing fuel effectiveness.

The Starship truck used a 100% carbon fibre cab with a streamlined and aerodynamic shape to help cut wind resistance

Another way to increase efficiency, is to make the most of present-day available fuel options. For many fleet operators this can be achieved through the use of diesel fuels with performance-enhancing additives. In the case of the Starship truck, a downspeed axle configuration, with advanced engine controls and automated manual transmission, improved efficiency and pulling power.

'WHAT YOU PUT IN MATTERS' WHEN IT COMES TO FUEL EFFICIENCY

While the hardware technologies used to design, build and operate the vehicle are the foundation of a hyper-efficient next-generation diesel truck, the success of the Starship Project also underlines the importance of what goes into the vehicle.

Alongside other best practice solutions, choosing premium consumables – that are specially formulated to protect truck engines and maintain peak performance under demanding conditions – can help fleet managers meet their current performance and efficiency targets, while also setting them up for future successes.

For example, the Starship truck used high-performance, low-viscosity Shell lubricants to help reduce friction in the engine. Compared to standard lubricants, these were shown to create a 2.6% benefit in fuel economy when compared to SAE 15W-40 oils, cutting fuel consumption while still providing premium protection against wear [8].

Likewise, as touched on above regarding diesel fuels with additives, what is in the tank can have a significant impact. Research has found that optimum fuel selection and management (including usage, storage and handling) can deliver fleet cost savings of up to 30% [9]. Reinforcing the importance of collaborating with industry experts, this also demonstrates how efficiencies provided by available technologies can help achieve current-day targets and long-term goals.

Research has found that optimum fuel selection and management (including usage, storage and handling) can deliver fleet cost savings of up to 30%

Among these solutions is Shell FuelSave Diesel with its dual detergent DYNAFLEX Technology, which is designed to help prevent the build-up of harmful carbon deposits on the injectors and remove any already present. This means the fuel can help increase both engine efficiency and fuel economy.

A MORE EFFICIENT FLEET IS POSSIBLE EVEN TODAY

Which brings us back to Bob Sliwa, who first entertained the idea of creating a super-aerodynamic, hyper fuel-efficient Class 8 rig alongside Shell; not only because of how inefficient he thought long-haul trucks were, but because he saw the potential improvements that could be made for future success. And he believed they could be implemented right now.

That is not to say every truck can be as easily well-equipped as the Starship truck. But what is clear, is that increased vehicle efficiency is attainable for today's fleet operators and this greater efficiency can go a long way to meeting the increasingly demanding goals that the transport industry of the future will encounter, such as lowering TCO and reducing carbon footprint. To get ahead of the curve, the technologies that are available today should be viewed by fleet operators as genuine enablers for their business, with regards to performance and profitability.

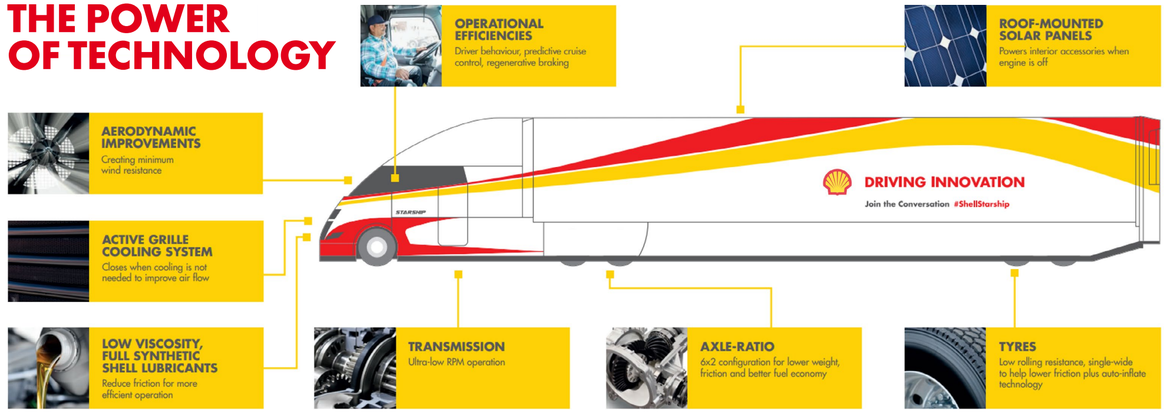
The technologies that are available today should be viewed by fleet operators as genuine enablers for their business

From choosing the most effective vehicle, fuel and lubricant technologies to capitalising on advice and collaboration with energy and technology experts, the Starship Project's remarkable journey confirms the opportunity in front of fleet operators. An opportunity that requires them to act now to identify truck efficiency improvements, then use available technologies to capitalise on them.

The Starship will be undertaking a second U.S. coast-to-coast run in the future, with the ambition of beating its previous efficiency figures, following some truck technology additions and modifications.

1. Interstate 10 (I-10) is the southernmost cross-country interstate highway in the American Interstate Highway System. It stretches from the Pacific Ocean at California State Route 1 (Pacific Coast Highway) in Santa Monica, California, to I-95 in Jacksonville, Florida. Major cities connected by I-10 include (from west to east) Los Angeles, Phoenix, Tucson, El Paso, San Antonio, Houston, Baton Rouge, New Orleans, Mobile, Tallahassee, and Jacksonville.
2. Freight tonne efficiency is the favoured statistic for judging the energy intensity associated with moving cargo from point A to B since it combines the weight of cargo being moved with the amount of fuel consumed.
3. Shell.com (2018). Shell and Airflow Truck Company Demonstrate a 248% Improvement in Freight Tonne Efficiency with the Starship Truck. [online] Available at: https://www.shell.com/business-customers/lubricants-for-business/news-and-media-releases/2018/shell-and-airflow-truck-company-demonstrate.html [Accessed 8 Jul. 2019].
4. Shell.com (2018) Starship – Hyper-Fuel Efficient Truck. [online] Available at: https://www.shell.com/motorist/oils-lubricants/rimula-truck-heavy-duty-engine-oil/airflow-starship.html [Accessed 8 Aug. 2019].
5. Acea.be. (2019). Average Vehicle Age | ACEA - European Automobile Manufacturers' Association. [online] Available at: https://www.acea.be/statistics/tag/category/average-vehicle-age [Accessed 5 Jul. 2019].
6. Trentacosta, M., Evans, D., Hardin, K. and Maguire, A. (2019). Reinventing The Truck. [online] Cdn.ihs.com. Available at: https://cdn.ihs.com/www/pdf/RTT-Whitepaper.pdf [Accessed 28 Jun. 2019].
7. Total Cost of Ownership (TCO) is defined by Shell Lubricants as the total amount spent on industrial equipment, including cost of acquisition and operation over its entire working life, including costs of lost production during equipment downtime.
8. TTNews.com (2018). Low-Viscosity Engine Oils Will Support Push for Improved Fuel Economy, Shell Says. [online] https://www.ttnews.com/articles/low-viscosity-engine-oils-will-support-push-improved-fuel-economy-shell-says [Accessed 8 Jul. 2019].
9. Making Fuel Work For Your Bottom Line. (2018). 1st ed. London: Shell Commercial Fuels, p.6.

THE POWER OF TECHNOLOGY



HOW TO STAY COMPETITIVE IN THE DIGITAL-FLEET AGE

SHELL COMMERCIAL FUELS IN COLLABORATION WITH
SANDEEP KAR, CHIEF STRATEGY OFFICER OF FLEET COMPLETE

"Technology is really changing the way fleet managers approach their assets. In the past, it was about 'what can I do with this truck?' Now it's 'what can this truck do for me?'" This is the opinion of Sandeep Kar, Chief Strategy Officer of fleet-digitisation specialist Fleet Complete, as he explains the impact of digital technology on modern fleets.

Data-driven technology enables fleets to: react in real time to maximise returns on investment; realise efficiencies; cut their operating costs; and, last but not least, lower CO2 emissions. And with fuel accounting for 23% of these total fleet costs [1], finding ways to optimise fuel consumption – by unlocking its full potential – has been a big part of the drive to increase efficiency through data.

Did you know: This need for greater education around data is evident in other sectors too. 69% of decision-makers in the mining industry suggest a lack of staff understanding of technology and the ability to interpret data, poses a concern around using Industry 4.0 technology [2].

So, how can fleets best use emerging technologies to drive down fuel costs, reduce their total cost of ownership and lessen their carbon footprint?

WHY DATA BOTH HELPS AND CHALLENGES FLEETS

The first step is identifying the issues at hand. When fleet managers were asked what their key challenge would be in the next three years, the most common response by far (52% of respondents) was how to increase operating efficiency [3]. While a further 45% said that choosing the wrong fuel had contributed to unplanned down time.

Did you know: In the lubricant sector, 39% stated that keeping up with latest best practices or trends and having too few maintenance staff were the two top maintenance challenges [4].

As digitisation proceeds rapidly, it creates an ever-widening gap between digitally engaged fleets and those that have not embraced digitisation. While the former is able to dynamically match their vehicles to the nearest load, at the best price, so as to maximise the return on fuel investment; the latter cannot leverage these optimisation tools to cut fuel consumption and operating costs.

The same gap is also opening up in areas such as performance tracking, data-led driver training and overall cost control. Even if you run the most efficient fleet in today's market, if you fail to respond to the potential efficiencies emerging as a result of digital advancements, your competitors are likely to overtake you by the time tomorrow arrives.

"Digitisation is opening up whole new business models," explains Kar. "These are based on the truck interacting with the world around it, becoming more efficient and in tune with its environment – for instance, using autonomous driving technology to improve fuel performance in stop-go urban conditions. Fleets that use these technologies, have the insights they need to generate more revenue."

"Digitisation is opening up whole new business models"

HOW FLEETS CAN USE DATA TO CUT FUEL EXPENDITURE

LOAD-BROKERAGE PLATFORMS

An average truck is on the road without a load roughly 28% of the time [5]. Under manual freight-matching, this was inevitable. By closing the information gap between hauliers and customers however, load-brokerage platforms make it possible for fleets to achieve close to full utilisation of their assets. Uber Freight are one recent example of companies' eagerness to transition into this area, with their reach set to expand to the European trucking market having seen the business model post more than $125 million in quarterly revenues in the United States [6].

An average truck is on the road without a load roughly 28% of the time

This won't just cut empty miles, either. By finding economically viable loads nearer to their route, using these platforms will reduce the number of miles travelled and help cut fuel costs.

TELEMATICS

Data-driven technologies can also help improve driving styles, as shown by Shell's telematics work with Turkish pharmaceutical company Sanofi, which oversaw a 27% reduction in accidents as well as a fuel saving of 4.4%, achieved in combination with Shell fuel with deposit control additives [7]. Using data from their telematics systems, fleets can train drivers to eliminate practices such as harsh braking and driving at high revolutions per minute (rpm), which doesn't just waste fuel but also puts increased wear on parts, particularly bearings.

Turkish pharmaceutical company Sanofi, which oversaw a 27% reduction in accidents as well as a fuel saving of 4.4%, achieved in combination with Shell fuel with deposit control additives

The same fleet-management software can also help drivers practice intelligent journey planning: choosing the optimum route to cut distance, avoid congestion and meet delivery times. One recent UK government study cites research suggesting that this approach can cut fuel costs by up to 15.4% [8].¬

DATA AND PREDICTIVE MAINTENANCE

Fleets can also use data – particularly data from connected sensors on the vehicle – to spot developing problems and fix them before they cause down time. According to one estimate, such predictive maintenance can cut unplanned downtime by up to 30% [9]. And, of course, by maintaining your vehicles in peak operating condition, you also help to keep fuel consumption down and power output up.

Of course, maintenance does not happen in a vacuum. There's little point in fine-tuning your fleet for efficiency and then filling it with base-quality fuel. Digitalisation can help companies maximise the value of choosing a premium fuel, by giving them the factual insight and knowledge where such products can make biggest efficiency improvements.

There's little point in fine-tuning your fleet for efficiency and then filling it with base-quality fuel

Using premium fuel with active deposit control additives, for example, helps clean up the engine [10] from carbon deposits and prevents further build-up (responsible for a 2% loss in efficiency and a 2.5% reduction in engine load-pulling power, when they accumulate on fuel injectors [11]). This results in higher engine efficiency and lower fuel consumption.

Using premium fuel with active deposit control additives, for example, helps clean up the engine

Analysing ongoing data on vehicle usage – to match fuel to the vehicle type, its environment and specific demands– helps fleets deliver the best possible combination of efficiency, performance and reliability.

THE RIGHT FUEL PARTNERS FOR THE FLEET OF TOMORROW

To realise the maximum benefit from tomorrow's digital technologies, fleets need to engage suitable energy experts. The right partner can help them gather the volume of data analytics and predictive technologies needed to spot relevant patterns, that fleet managers can then use to optimise for lower fuel consumption.

52% of businesses say they would benefit from help to understand future energy and vehicle technology options that may be suitable for their company [3]. When you work with experts like Shell, the knowledge you gain can help reap optimal benefits from the technology and fuel you employ today. Furthermore, this can also help prepare your fleet for future technologies – such as over-the-air updates and autonomous vehicles – which promise a significant competitive edge to those who embrace and master them.

Did you know: This is reflected in the construction industry too, with 53% of construction managers also claiming to need more support in this space [12].

MAKE THE MOST OF YOUR FLEET DATA

With the right approach to data optimisation and combining with the right fuel choice – fleets can achieve significant cost efficiencies now and lay the groundwork for even greater benefits in the future.

"Increasingly," says Sandeep Kar, "fleets are using digitisation to stay relevant and to future-proof their business. And to maximise revenue from digitisation, fleets often need some outside coaching. But it is worth it. We've seen early-stage companies using fleet brokerage and other digital technologies already supporting some extremely large multinationals."

An easier early win [in the journey toward decarbonisation] will be to increase investment in aerodynamics, telematics and digital freight brokerage to reduce fuel consumption and increase operating efficiencies and vehicle utilisation, thereby lowering carbon emissions [13].

The initial challenge for fleet managers is perceiving the connected nature of digitisation and more tangible daily considerations and costs, such as fuel choice. Once the dots are joined between these factors, the data speaks for itself, and embracing digitisation no longer seems like a choice, but rather a necessity.

1. Global Fleet. (2019). Inside the pieces of the TCO pie. [online] Available at: https://www.globalfleet.com/en/leasing-and-rental/north-america/analysis/inside-pieces-tco-pie?t%5B0%5D=TCO&t%5B1%5D=Fuel&t%5B2%5D=SMR&t%5B3%5D=CO2&t%5B4%5D=Mileage&t%5B5%5D=Car%20policy&t%5B6%5D=United%20States&curl=1 [Accessed 18 Jul. 2019].
2. Shell Global, 'Shell TCO Phase 2, Mining: Global Report, Exploring Industry 4.0'.
3. Turning Fuel into a Competitive Edge, Shell, 2018.
4. Shell Global, 'Shell TCO Phase 2, Fleet: Global Report, Exploring Industry 4.0'.
5. Davies, R. (2019). Digital freight matching will revolutionize the trucking industry–eventually. [online] GetApp Lab. Available at: https://lab.getapp.com/digital-freight-matching-will-revolutionize-trucking-industry/ [Accessed 18 Jul. 2019].
6. Busvine, Douglas (2019). Uber Freight launches in Germany, taking on local competition. [online] UK.Reuters.com. Available at: https://uk.reuters.com/article/uk-uber-germany/uber-freight-launches-in-germany-taking-on-local-competition-idUKKCN1UJ0BE [Accessed 26 Jul. 2019].
7. Destination: Instant Insight, Shell Fleet Solutions.
8. How fleets can use driver behaviour and vehicle efficiency, UK Department of Transport, February 2018.
9. Park, J. (2019). How Data Is Changing Predictive Maintenance. [online] Truckinginfo.com. Available at: https://www.truckinginfo.com/312738/how-data-is-changing-predictive-maintenance [Accessed 18 Jul. 2019].
10. Key fuel system components such as fuel injectors.
11. Fuel-Injector Fouling Causes Loss in Efficiency And Load-Pulling Power Paper, 2017, Shell.
12. This survey, commissioned by Shell Commercial Fuels and conducted by independent research firm Edelman Intelligence, polled 500 fuel decision makers in the construction sector in 10 countries (Germany, Hong Kong, Indonesia, Malaysia, Netherlands, Philippines, Singapore, South Africa, Thailand, Turkey).
13. KPMG, 'The decarbonisation of transport: Putting the UK on the road to success, 2019, (https://home.kpmg/content/dam/kpmg/uk/pdf/2019/07/decarbonisation-of-transport.pdf)

WHY HOUSEKEEPING MATTERS: LAYING THE FOUNDATION FOR OPTIMUM FUEL EFFICIENCY AND REDUCED COSTS

THIS ARTICLE BUILDS ON THE RESEARCH PAPER PUBLISHED IN 2019 BY **SHELL COMMERCIAL FUELS** ON THE CONSTRUCTION INDUSTRY, TITLED **"MAKING FUEL WORK FOR YOUR BOTTOM LINE"**. THE RESEARCH WAS A GLOBAL SURVEY CONDUCTED WITH 500 FUEL DECISION MAKERS.

From embracing new technologies to addressing environmental challenges, the construction industry has a lot of evolving priorities. However, a recent survey by Shell Commercial Fuels showed that, while these are on the agenda of construction companies, the top priority today and in the near future still remains improving operating efficiency [1].

And it is no wonder why: efficiency, arguably, underpins all avenues to success, whether that's measured in deadlines met, emissions lowered, or costs reduced. But what should construction companies be prioritising in order to maximise efficiency?

Dig a little deeper and it becomes apparent that fuel – a heavily invested consumable – is not being properly managed. In addition to fuel accounting for 20% of operating costs, according to this research 44% of companies say fuel choice has also contributed to unplanned downtime [1]. At first glance, these two statistics don't seem to add up. How can fuel, an important financial factor, also cause so many productivity issues? Add one final statistic into the mix and it suddenly becomes clear: when asked, only 16% of construction companies say they manage their fuel 'very effectively'.

44% of construction companies say fuel choice has contributed to unplanned downtime

Addressing this does not require a huge investment in new machinery, technology or staff. Rather, it can be as simple as adopting a better maintenance strategy. This begins with purchasing high-quality, additivated diesel , followed by implementing an effective fuel housekeeping regime – from correct storage, through effective handling and the requisite training – ultimately enabling construction companies make the most of their fuel investment on site.

SECURE STORAGE

41% of construction companies admitted that fuel storage contributes to breakdowns [1]. The reason being: fuel arriving on site is viewed by some as the end of the process, when in reality, it's just the beginning. The adage 'out of sight, out of mind' should not apply here; in fact, the opposite approach needs to be taken. There's little point in purchasing high-quality additivated diesel, to only limit its performance (and incur unnecessary costs and lower efficiency) through poor storage practices.

41% of construction companies admitted that fuel storage contributes to breakdowns

CHOOSING YOUR TANK

To combat this, thought must first be given to the type of tank the fuel is stored in and how this storage impacts fuel quality, equipment efficiency and overall business performance. Since, when diesel is not stored properly, it starts to deteriorate. So consider tanks made of compatible materials, e.g. coated steel tanks that will not leech into diesel and cause impurities to develop.

MANAGING THE ELEMENTS

To comply with fuel storage regulations and to avoid safety risks, tanks may not be located inside non-designated buildings, but must sit outdoors. This brings its own issues, since tanks are consistently exposed to the elements. To reduce oxidation caused by contact with oxygen, light and temperature, tanks should be tightly sealed to minimise any exposure. They should also be located away from heat and out of direct sunlight, as diesel has a tendency to age at higher temperatures. Potential condensation of humidity in case of extreme temperature changes should also be monitored.

3 TOP TIPS FOR IMPLEMENTING EFFECTIVE FUEL MANAGEMENT

1. Implement regular staff training around fuel housekeeping best practices, emphasising the efficiency and performance consequences of poor fuel storage and handling
2. Seek out fuel experts, such as Shell Commercial Fuels, who can supplement your current operations with extensive industry expertise and knowledge, to help you implement the right fuel management strategy for your business
3. Choose advanced additivated diesel, with efficiency, dehazing and fuel stability benefits, that can – when combined with proper fuel housekeeping – improve performance and reliability of equipment, and reduce its total cost of ownership.

EFFECTIVE HANDLING

The risk of contamination is not eliminated once effective storage practices are secured, however. Correct storage must be complemented by safe handling procedures. Indeed, 60% agree that it is important to understand the impact of both [1].

PREVENTING CONTAMINATION

Moisture from the surrounding atmosphere is a key concern for diesel. Being denser than fuel, water droplets will settle out at the bottom of the tank and can increase the likelihood of ageing and bacterial growth - especially if the diesel contains biocomponents. In fact, a water content of above just 0.05% can reduce the life of diesel injectors by as much as half [2]. For this reason planned tank maintenance is recommended to keep the inside of the tank clean and dry and therewith fit for purpose. Add the fact that storage tanks are often located in dirty or dusty environments – this additional requires care e.g. breathers that prevent contamination and special care during refueling.

A water content of above just 0.05% can reduce the life of diesel injectors by as much as half

MONITORING YOUR FUEL

Unfortunately, preventing any water from entering the fuel mix at all is unrealistic, therefore it is key that storage tanks are consistently monitored, to ensure that the diesel is still fit for purpose. To assist with this, many storage tanks are designed with bottom valves allowing to periodically drain off water. Other checks that should be regularly included: maintaining seal integrity; ensuring filters are unclogged; and proofing the tank for any damage that could cause leakage. Tanks should always be kept relatively full if not used for longer time, with only a small air space above the fuel line to minimize condensation of air humidity and corrosion.

If the fuel is stored for longer (or even just a few months in case of harsh conditions), it should even be considered to take samples and check if the fuel is still OK.

THE IMPORTANCE OF TRAINING & PARTNERSHIPS

6 out of 10 companies recognise the importance of all parts of their business understanding the impact of proper fuel storage and handling, including senior management. Therefore, it's vital that the key messages are relayed throughout the entire company [1]. If knowledge sharing is something your company struggles with, then consider first acting on these three top tips.

Construction is an industry built on numbers, from the dates of a deadline to the measurement of materials. With margins ever-tighter, construction companies must find gains wherever they can. Research, such as Shell's survey, breaks these numbers down, zooming into how gains can be achieved. In this case, by choosing high-quality, additivated fuel and partnering with trusted fuel experts, businesses can reap tangible performance benefits by adopting successful fuel housekeeping strategies.

1. This survey commissioned by Shell Commercial Fuels and conducted by independent research firm Edelman Intelligence, polled 500 fuel decision makers in the construction sector in 10 countries (Germany, Hong Kong, Indonesia, Malaysia, Netherlands, Philippines, Singapore, South Africa, Thailand, Turkey).
2. David Doyle. Effects of Poor-Quality Fuel on Diesel Engine Reliability, 16 May 2012, ALS Tribiology. Available at: http://esource.alstribology.com/WB045_May_2012/Effects%20of%20Poor%20Quality%20Fuel%20on%20Diesel%20Engine%20Reliability.html [Accessed 26 Jul. 2019].

ADVANCING TRANSPORT ENERGY EFFICIENCY

ROAD TRANSPORT ENERGY USE IN THE PAST 30 YEARS HAS DOUBLED

As populations grow, energy consumption is **increasing**

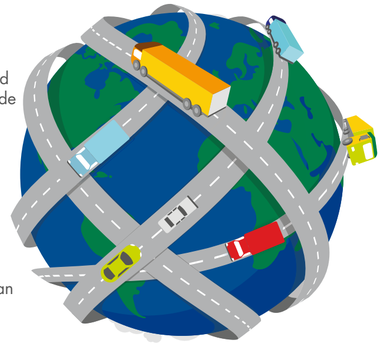
Energy needed to power **transport** could increase

70% by 2050[2]

Transport now accounts for around

1/5

of global energy-related carbon dioxide emissions[1]



And more than

1/4

of the world's energy use[1]

INNOVATIONS GREAT AND SMALL

Around the world, Shell is working closely with our partners to help tackle energy and transport challenges by advancing the development of ever more efficient vehicles and alternative energy sources.

BRINGING HYDROGEN TO THE HIGHWAY

In Germany, Shell is working with the government and five companies to install a network of around 400 hydrogen fuelling stations across the country by 2023.

THE SHELL CONCEPT CAR

This ultra-compact prototype vehicle combines the best of today's technology to use a third less energy over its lifetime than a typical city car.

NEXT-GENERATION HYPER-FUEL MILEAGE TRUCK

Shell Lubricants and AirFlow Truck Company have developed a new hyper-fuel mileage Class 8 tractor trailer, Starship, which recorded a 2.48 times improvement in freight tonne efficiency over the average Class 8 truck.

To find out more about Shell's role in shaping the future of transport visit: www.shell.com/energy-and-innovation/the-energy-future/future-transport.

1. Shell, 'Future Transport Narrative', 2018.
2. International Energy Agency, Global transport outlook to 2050

IS EFFECTIVE MAINTENANCE THE KEY TO UNLOCKING THE POSSIBILITIES OF INDUSTRY 4.0 IN MINING?

COLLABORATION AND PARTNERSHIP – A WAY FORWARD FOR EFFECTIVE MAINTENANCE

Rapid advances in technology are increasingly shaping the way the mining industry operates. Bit by bit, companies are investing in Industry 4.0 to better understand their resources, to optimise material and equipment flows, to anticipate problems and to increase automation [1]. While new technology is not a solution for everything, recent research commissioned by Shell has found 72% of mining companies today are hopeful that next-generation technologies will deliver essential cost savings [2].

While there is certainly optimism around the uptake of Industry 4.0, in the background is an industry experiencing a number of challenges making it difficult to convert this intention into action. For example, depleting ore reserves and declining ore grades in existing operations mean that companies have to mine deeper to reach new deposits, which in turn increases costs – problematic when Industry 4.0 often requires high up-front investment. Additionally, due to the infancy of Industry 4.0, there is a struggle to nail down strategic focus when it comes to new innovations as it is tough for businesses to assess the benefits of much of what is on offer, and if and where the investment will pay off in terms of Total Cost of Ownership (TCO) [3].

So, while 70% of companies are now using at least one industry 4.0 technology to improve productivity and operational efficiency, there is hesitance in wide-spread adoption. Just one in three direct spend towards cloud-based technologies (35%) and sensors (34%), and only 24% towards autonomous equipment. However, as the industry moves forward, to remain competitive companies must start to recognise the benefits and long-term saving opportunities that new technologies can bring.

In this vein, attention to machinery is vital. Given the variable nature of mining, frequently operating in extreme locations with challenging geology, equipment is under stress and susceptible to breakdowns. Now, thanks to 4-D systems, the human element in data gathering can be reduced making the assessment process more efficient. Mines have also become better able to predict and identify potential equipment issues, all helping to lower costs and increase profits.

Already Industry 4.0 is showing clear potential to deliver long-term savings. Understandably, however, given the industry's volatile markets and local challenges, many companies feel concerned by high upfront costs, with 63% believing that these could outweigh longer term benefits. Rather than investing in new technologies across the board, 83% are choosing to 'sweat' existing assets while they are still operational, instead of making what they see as an expensive leap into the digital unknown.

Rather than investing in new technologies across the board, 83% are choosing to 'sweat' existing assets

Bridging this knowledge gap by effectively communicating the importance of investment will be key to progressing the industry. However, it is also evident that current machinery must be equipped to optimise both its performance and remaining lifespan. One way of doing so is ensuring the correct fuel is being used to power a business' parc. In such demanding environments, Shell FuelSave Diesel with DYNAFLEX Technology (SFSD) can help to protect critical engine components such as fuel injectors, by cleaning them up from carbon deposits and preventing further build-up - thus enabling improved fuel economy. Added to this, SFSD is designed to help improve equipment efficiency and reliability, providing more load-pulling power when needed especially with high loads.

Current machinery must be equipped to optimise both its performance and remaining lifespan

By creating more profitable operations through paying more attention to important variables such as fuel choice, it eases cost concerns and protects new high-value industry 4.0 equipment. And for those considering making the leap to industry 4.0, it ensures lower TCO of current machinery to make investment into these new fields possible.

Amidst a lot of understandable uncertainty, there is a clear sentiment among the mining industry – that decisions do not need to be made in silo. Fortunately, Shell is armed with technical experts worldwide and is well placed to collaborate and navigate this change with customers.

1. Industry 4.0 technologies are defined as technologies that support the digitisation and automation of operations (e.g. sensors, connected equipment, autonomous equipment, robotics, cloud based or big data-based technologies).
2. This survey, commissioned by Shell Lubricants and conducted by research firm Edelman Intelligence, is based on 350 interviews with Mining sector staff who purchase, influence the purchase or use lubricants / greases as part of their job across 7 countries (USA, China, India, Germany, Russia, Indonesia and the UK) from March to April 2018. For more information, please visit www.edelmanintelligence.com.
3. Total Cost of Ownership (TCO) is defined by Shell Lubricants as the total amount spent on industrial equipment, including cost of acquisition and operation over its entire working life, including costs of lost production during equipment downtime.

EIGHT STEPS TOWARDS LOWERING EMISSIONS

In most major markets, public concern about climate change has increased significantly over just the last year. And this shift is likely to have an impact on commercial fleets.

In 2018, the European Social Survey found that a third of Europeans want the EU to increase taxes on fossil fuels [1]. And a 2018 survey by Nielsen found that 68% of Europeans now say they prefer sustainable companies [2].

This shift in public opinion poses a challenge for fleet managers. The average European heavy commercial vehicle is on the road for twelve years [3]. This leaves hauliers looking for ways to make their fleets more sustainable and cut emissions, using existing – and even old – technology.

The average European heavy commercial vehicle is on the road for twelve years

How can commercial fleets respond to legislative and consumer pressure to be more sustainable now, with their current vehicles?

Here are eight tips we learnt developing the Starship Truck and working with other OEMs which you can apply to your fleet to help reduce emissions today.

Add sustainably sourced biofuels to your standard fuel. But do this only in consultation with your fuel supplier, who can help you do this safely and effectively.

The modern fleet manager is far from powerless in the face of demands to reduce emissions. With the right combination of improved practices, modern technologies and premium consumables, you can cut your emissions and your fuel consumption right now.

And that isn't just good for the environment, it helps your bottom line too.

CUT ROLLING RESISTANCE: with the right tyres, the right axle and bearing grease, and the right maintenance regime, you can help improve fuel efficiency by reducing rolling resistance.

REDUCE DRAG: using add-ons such as side-skirts, trailer tails and reducing the gap between trailer and tractor can all help reduce drag and improve fuel efficiency.

USE PREMIUM LUBRICATION: high-quality, low-viscosity engine oil – with friction-reducing additives – cuts mechanical loss, helps to improve efficiency and reduces emissions.

USE VEHICLE AUTOMATION: automating even simple things such as optimal gear changes to operate the engine in most efficient range helps to improve fuel efficiency and reduce emissions.

SWITCH TO INTEGRATED FLEET MANAGEMENT: plan routes, maximise utilisation and dynamically re-route to cut fuel consumption with the latest telematic fleet solutions.

USE BIODIESELS: add sustainably sourced biofuels to your standard fuel. But do this only in consultation with your fuel supplier, who can help you do this safely and effectively.

MAXIMISE UTILISATION RATES: use freight-brokerage apps and fleet management tools to maximise utilisation rates, cut idling and eliminate empty miles.

TAILOR DRIVING STYLES: use information from the truck's telematics and other systems to help coach drivers to be more fuel efficient in their driving styles.

With the right combination of improved practices, modern technologies and premium consumables, you can cut your emissions and your fuel consumption right now

1. Fitzgerald, R., Poortinga, W., Böhm, G., Steg, L., Whitmarsh, L., Ogunbode, C., Dorer, B., Douhou, S., Villar, A., Winstone, L. and Rojas, D. (2019). European Attitudes to Climate Change and Energy: Topline Results from Round 8 of the European Social Survey. Available at: www.europeansocialsurvey.
2. Nielsen.com. (2019). Global Consumers Seek Companies That Care About Environmental Issues. [online] Available at: www.nielsen.com/uk/en/insights/news/2018/global-consumers-seek-companies-that-care-about-environmental-issues.html [Accessed 15 May 2019].
3. Acea.be. (2019). Average Vehicle Age | ACEA - European Automobile Manufacturers' Association. [online] Available at: www.acea. be/statistics/tag/category/average-vehicleage [Accessed 15 May 2019].
4. McKinsey & Company, 'How industry can move toward a low-carbon future', 2018, (https://www.mckinsey.com/business-functions/sustainability/our-insights/how-industry-can-move-toward-a-low-carbon-future).

USING BIODIESEL – HOW TO MANAGE THE TCO EQUATION

Shell has been evaluating biodiesel's impacts and developing lubricants to meet customers' evolving needs.

The continually growing need for energy – to support population and economic growth, while improving standards of living – is demanding more from fuel and fuel technology. As society moves toward a greater awareness - and adoption - of environmentally sustainable options, alternative fuels are becoming a more widely considered choice also for commercial fleet and equipment operators. Any future fuels, however, must meet existing fuel specifications to ensure operations are not compromised. With this balance between performance and sustainability key, many sectors are looking at biodiesel as another means of fuelling their operations.

Biodiesel, or FAME (Fatty Acid Methyl Ester), is a type of diesel fuel that is made from vegetable oil such as rapeseed, soybean, coconut or palm oil, rather than fossil crude oil and can be used in neat form or as a blend component at different levels, though generally up to 5% (ASTM D975) or 7% (EN590).

While most commonly known for its potential - depending on feedstock and production - to lower CO2 emissions on a well-to-wheel basis, when compared with conventional fossil diesel, high quality biodiesel has a range of benefits from improved fuel lubricity and a higher cetane number to lower import bills and increased income for farmers in some countries.

But this alternative poses some operational challenges – whether related to equipment compatibility or engine performance.

Heavy-duty fleet or equipment operators who use products with bio content particularly at levels higher than 10%, need to be aware that some properties of biodiesel are different to those of fossil diesel. This warrants certain changes in the way fuels with higher bio concentrations are stored and handled.

A consideration when using biodiesel can be its lower oxidation stability compared to fossil diesel and its susceptibility to microbial growth. Lower oxidation stability can lead to corrosion whereas microbial growth can cause blocking of filters and fuel lines - bringing operational challenges, downtime and higher operating costs. A viable solution is Shell FuelSave Diesel with DYNAFLEX Technology [1], which is designed to help keep fuel more stable in presence of bio-components, thus increasing vehicle and equipment reliability [2]. Its formula promotes good water separation and reduced microbial growth [2].

Shell FuelSave Diesel with DYNAFLEX Technology is designed to help keep fuel more stable in presence of bio-components

Another challenge can be fuel dilution (fuel mixing with the lubricant) which causes the biodiesel to affect the life and performance of the engine oil. This can be a major concern, as the biodiesel may increase oil oxidation, which prematurely ages the oil and can cause engine deposits, pumping issues and in turn, impact productivity and bottom-line. Consequently, it is important to ensure proper engine oil performance in these areas to help manage TCO.
As a technology leader, Shell has been evaluating biodiesel's impacts and developing lubricants to meet customers' evolving needs - Shell Rimula and Shell Rotella engine oils are globally compatible with biofuels.

In addition to using high-quality fuels and lubricants suitable for bio applications, proper storage and handling is important for smooth operations, especially when biodiesel is used especially at higher concentrations of more than 10%.

With over 30 years of involvement in distributing biofuels, Shell has long-standing experience in how to store, blend and handle biofuels to supply customers around the world. Shell draws knowledge from its own biofuels research and collaboration with leading biotechnology companies and academic institutions to fuel innovation in this space.

1. DYNAFLEX technology or DYNAFLEX formulation are our names for our latest generation of advanced formulations for gasoline and diesel fuels. See www.shell.com/commercialfuels for more information.
2. Compared to regular fuel oil without fuel economy formula. Actual savings may vary according to vehicle, driving conditions and driving style. Internal Shell tests and with our customers have shown a range of fuel savings depending on age of vehicle and type of operations.

THE FOLLOWING HOUSEKEEPING PRACTICES CAN HELP ENSURE THE PRODUCT STAYS AT HIGH QUALITY:

- **MINIMISE WATER INGRESS INTO THE FUEL TO PREVENT MICROBIAL GROWTH AND CORROSION** - monitor the amount of water entering the tank and regularly remove free water that has accumulated
- **MONITOR OXIDATION STABILITY OF THE FUEL** - regular checks are recommended if biodiesel is stored for more than 1 month
- **STORE THE FUEL AT THE RIGHT TEMPERATURE** - most underground storage facilities are adequate; above ground storage might need protection with insulation
- **USE COMPATIBLE MATERIALS IN YOUR STORAGE SYSTEM** – for example, stainless steel, carbon steel, or aluminium

FUTURE-PROOFING YOUR FLEET

TOP TIPS TO PREPARE YOUR FLEET FOR THE NEW ERA OF MOBILITY

The transport sector is undergoing a huge transformation, which means that a Fleet Manager's job has never been more challenging. Staying on top of the latest developments and planning for an unpredictable future is tough, which is why we've put together five top tips to help you future-proof your fleet:

1. LOOK FOR ALTERNATIVES

Alternative fuels are becoming more viable options. The future points largely towards electric vehicles. While range has been one of e-mobility's biggest hurdles, charging station infrastructure is expanding rapidly to help tackle this concern.

There are other lower-emission fuel alternatives available too, including hydrogen fuel cell vehicles and (gas-to-liquid) GTL fuel. It's important to understand the options available to make an informed decision about what's best for your fleet.

2. KNOW YOUR COMPETITION

Only by knowing what's happening in your industry, can you plan effectively for the future. While this can be done on a formal basis via a specialist company, industry events, such as tradeshows, are a great way to stay in tune with the latest developments.

Educating staff so they are ready and able to adapt will be key to prepare for this transformation

3. PLAN FOR ECONOMIC CHALLENGES

Fleet managers should aim to forecast possible economic scenarios to avoid unforeseen pitfalls. For example, import/export tariffs, which could affect the prices of vehicles, parts and fuel are among the possible challenges that fleets could face in the future.

4. EMBRACE NEW TECHNOLOGY

From telematics to driverless vehicles, there is a shift towards a more connected fleet network, which may see a change in the role of fleet employees. Educating staff so they are ready and able to adapt will be key to prepare for this transformation.

5. READ THE SMALL PRINT

When it comes to legislation, there's no excuse not to stay informed and compliant. For example, 2019 saw the first ever EU-wide CO2 emissions standards for heavy-duty vehicles. Stay up to speed, and if in doubt, seek expert guidance.

1. McKinsey & Company, 'Climate risk and decarbonization: What every mining CEO needs to know', 2020, (https://www.mckinsey.com/business-functions/sustainability/our-insights/climate-risk-and-decarbonization-what-every-mining-ceo-needs-to-know).